

**COMPUTER ASSISTED IDENTIFICATION
OF FILAMENTOUS BACTERIA**

Field of the Invention

This invention relates generally to the field of biological waste water treatment processes and more particularly, but not by way of limitation, to the identification of a filamentous organism in a biological sample.

Background of the Invention

Filamentous organisms (filamentous bacteria) are very important to the biological process that occurs in a wastewater treatment plant. They form a backbone for activated sludge floc which helps the sludge settle in the secondary clarifier. However, excessive filamentous bacteria can cause bulking and foaming in the biological process. Research has indicated that various bulking and foaming problems are caused by the type and amount of filamentous bacteria present.

Therefore, correctly identifying filamentous bacteria in biological treatment processes, especially in activated sludge, is very important for proper diagnosis of a specific bulking or foaming problem. It is the necessary first step in bulking and foaming control. Certain filaments are associated with particular operational conditions. These bacteria can be, for instance, sulfur oxidizing filaments, low dissolved oxygen filaments, or low food to microorganism ratio (F/M) filaments. Different filaments require different control methods. Correct typing of filamentous bacteria gives an operator additional knowledge with which to design the proper control for bulking and foaming in the wastewater treatment plant.

Typing of filamentous bacteria is presently conducted using a microscope. Under the microscope, each filamentous organism is characterized using a number of parameters. These parameters include branching, motility, filament shape, filament location, attached growth, sheath, crosswalls, filament diameter, filament length, cell shape, cell size, presence of sulfur deposits, presence of other granules, Gram stain and Neisser stain. In total, 15 parameters